Claims

1. A ~~method for animation~~ of an object comprising:

determining a source projection matrix for projecting a source vertex array of a source object from an original space to an ortho-normal space;

determining a destination projection matrix for projecting a destination vertex array of a destination object from an original space to an ortho-normal space;

determining a zero-mean source vertex array of said source vertex array;

determining a zero-mean destination vertex array of said destination vertex array;

transforming said zero-mean source vertex array to a transformed source vertex array using said source projection matrix;

transforming said zero-mean destination vertex array to a transformed destination vertex array using said destination projection matrix;

computing an interim vertex array in said ortho-normal space based on a linear interpolation of said transformed source vertex array and said transformed destination vertex array;

computing an interim projection matrix based on a linear interpolation of said source projection matrix and said destination projection matrix; and

transforming said interim vertex array from said ortho-normal space to said original space ~~based on said interim~~ projection matrix.

2. The method as recited in claim 1 further comprising:

displaying an interim object based on said interim vertex array in said original space at a time between display times of said source object based on said source vertex array and said destination object based on said destination vertex array, thereby, producing said animation of said object.

3. The method as recited in claim 1 further comprising:

determining a two-dimensional coordinates of said source object, thereby producing said source vertex array in said original space; and

determining a two-dimensional coordinates of said destination object, thereby producing said destination vertex array in said original space.

4. The method as recited in claim 4 further comprising:

matching each point in said source vertex array to a point in said destination array, thus creating a link index array; and

matching sizes of said source and destination vertex array in accordance with said linking index array.

5. The method as recited in claim 4 further comprising:

determining a range of possible linking points;

examining said range of possible linking points for determining a smallest accumulative cost; and

wherein said created link index array corresponds to said smallest accumulative cost.

6. The method as recited in claim 4 further comprising:

ortho-normalizing said source vertex array resulted from said matching sizes of said source and destination vertex array to produce ortho-normalized source vertex array; and

ortho-normalizing said destination vertex array resulted from said matching sizes of said source and destination vertex array to produce ortho-normalized destination vertex array.

7. The method as recited in claim 6 further comprising:

creating a mapping matrix of said ortho-normalized source vertex array to said ortho-normalized destination vertex array in said ortho-normalized space.

8. The method as recited in claim 7 wherein said ortho-normalizing said source vertex array comprises:

determining a zero-mean source vertex array;

determining a source transformation matrix; and

using said a zero-mean source vertex array and said source transformation matrix to produce said ortho-normalized source vertex array.

9. The method as recited in claim 7 wherein said ortho-normalizing said destination vertex array comprises:

determining a zero-mean destination vertex array;

determining a destination transformation matrix; and

using said a zero-mean destination vertex array and said destination transformation matrix producing said ortho-normalized destination vertex array.

10. The method as recited in claim 8 wherein said determining said source projection matrix is based on said mapping matrix and said source transformation matrix.

11. The method as recited in claim 9 wherein said determining said destination projection matrix is based on said destination transformation matrix.

12. An apparatus for animation of an object comprising:

means for determining a source projection matrix for projecting a source vertex array of a source object from an original space to an ortho-normal space;

means for determining a destination projection matrix for projecting a destination vertex array of a destination object from an original space to an ortho-normal space;

means for determining a zero-mean source vertex array of said source vertex array;

means for determining a zero-mean destination vertex array of said destination vertex array;

means for transforming said zero-mean source vertex array to a transformed source vertex array using said source projection matrix;

means for transforming said zero-mean destination vertex array to a transformed destination vertex array using said destination projection matrix;

means for computing an interim vertex array in said ortho-normal space based on a linear interpolation of said transformed source vertex array and said transformed destination vertex array;

means for computing an interim projection matrix based on a linear interpolation of said source projection matrix and said destination projection matrix; and

means for transforming said interim vertex array from said ortho-normal space to said original space based on said interim projection matrix.

13. The apparatus as recited in claim 12 further comprising:

means for displaying an interim object based on said interim vertex array in said original space at a time between display times of said source object based on said source vertex array and said destination object based on said destination vertex array, thereby, producing said animation of said object.

14. In a communication system, a method for animation of an object comprising:

transmitting from a transmitter to a receiver a source projection matrix for projecting a source vertex array of a source object from an original space to an ortho-normal space;

transmitting from said transmitter to said receiver a destination projection matrix for projecting a destination vertex array of a destination object from an original space to an ortho-normal space;

determining a zero-mean source vertex array of said source vertex array;

determining a zero-mean destination vertex array of said destination vertex array;

transforming, in said receiver, said zero-mean source vertex array to a transformed source vertex array using said source projection matrix;

transforming, in said receiver, said zero-mean destination vertex array to a transformed destination vertex array using said destination projection matrix;

computing, in said receiver, an interim vertex array in said ortho-normal space based on a linear interpolation of said transformed source vertex array and said transformed destination vertex array;

computing, in said receiver, an interim projection matrix based on a linear interpolation of said source projection matrix and said destination projection matrix; and

transforming, in said receiver, said interim vertex array from said ortho-normal space to said original space based on said interim projection matrix.

15. The method as recited in claim 14 further comprising:

displaying, on a display in communication with said receiver, an interim object based on said interim vertex array in said original space at a time between display times of said source object based on said source vertex array and said destination object based on said destination vertex array, thereby, producing said animation of said object.

16. In a communication system, an apparatus for animation of an object comprising:

a transmitter for transmitting to a receiver a source projection matrix for projecting a source vertex array of a source object from an original space to an ortho-normal space, and transmitting a destination projection matrix for projecting a destination vertex array of a destination object from an original space to an ortho-normal space; and

a controller in communication with said receiver for transforming a zero-mean source vertex array of said source vertex array to a transformed source vertex array using said source projection matrix, transforming a zero-mean destination vertex array of said destination vertex array to a transformed destination vertex array using said destination projection matrix, computing an interim vertex array in said ortho-normal space based on a linear interpolation of said transformed source vertex array and said transformed destination vertex array, computing an interim projection matrix based on a linear interpolation of said source projection matrix and said destination projection matrix, transforming

said interim vertex array from said ortho-normal space to said original space based on said interim projection matrix.

17. The apparatus as recited in claim 16 further comprising:

a display, in communication with said receiver, for displaying an interim object based on said interim vertex array in said original space at a time between display times of said source object based on said source vertex array and said destination object based on said destination vertex array, thereby, producing said animation of said object.

18. A processor for animation of an object comprising:

means for determining a source projection matrix for projecting a source vertex array of a source object from an original space to an ortho-normal space, and a destination projection matrix for projecting a destination vertex array of a destination object from an original space to an ortho-normal space;

means for transforming a zero-mean source vertex array of said source vertex array to a transformed source vertex array using said source projection matrix, and for transforming a zero-mean destination vertex array of said destination vertex array to a transformed destination vertex array using said destination projection matrix; and

means for computing an interim vertex array in said ortho-normal space based on a linear interpolation of said transformed source vertex array and said transformed destination vertex array, computing an interim projection matrix

based on a linear interpolation of said source projection matrix and said destination projection matrix, and transforming said interim vertex array from said ortho-normal space to said original space based on said interim projection matrix.

19. The processor as recited in claim 18 further comprising:

means for coupling to a display for displaying an interim object based on said interim vertex array in said original space at a time between display times of said source object based on said source vertex array and said destination object based on said destination vertex array, thereby, producing said animation of said object.

20. In a communication system, a method for animation of an object in a receiver, comprising:

determining and transmitting to said receiver a source projection matrix for projecting a source vertex array of a source object from an original space to an ortho-normal space and a destination projection matrix for projecting a destination vertex array of a destination object from an original space to an ortho-normal space.

21. The method as recited in claim 20 further comprising:

receiving and transforming a zero-mean source vertex array of said source vertex array to a transformed source vertex array using said source projection matrix and transforming a zero-mean destination vertex array of said

destination vertex array to a transformed destination vertex array using said destination projection matrix; and

computing an interim vertex array in said ortho-normal space based on a linear interpolation of said transformed source vertex array and said transformed destination vertex array, computing an interim projection matrix based on a linear interpolation of said source projection matrix and said destination projection matrix, and transforming said interim vertex array from said ortho-normal space to said original space based on said interim projection matrix.

22. The method as recited in claim 20 further comprising:

displaying on a display in communication with said receiver an interim object based on said interim vertex array in said original space at a time between display times of said source object based on said source vertex array and said destination object based on said destination vertex array, thereby, producing said animation of said object.